Neonatal Respiratory Diseases

RDS

Complex respiratory disease characterized by surfactant deficiency

Higher surface tension at the surface of alveoli

Diffuse alveolar atelectasis

Interferes with normal exchange of oxygen and carbon dioxide.

Incidence 50% for 26 week to 28 weeks

Risk factors:

Low gestational age

Male

Born to diabetic mothers

Born after an asphyxial insult

Born after maternal-fetal hemorrhage

Multiple gestation

Signs and Symptoms of RDS

Difficulty in establishing normal respiration

Grunting

Intercostal and sternal retractions

Cyanosis

Tachypnea

CXR

Diffuse bilateral reticulogranular (ground glass appearance

Air bronchogram

Poor lung expansion

RDS Management

Antenatal steroid (prevention)

Surfactant Therapy

prevent and minimize atelectasis (CPAP, Ventilation)

Treat underlying infection

Congenital pneumonia

Sources :

In utero ( transplacental transfer of organisms and aspiration of pathogens from amniotic fluid)

During delivery through aspiration of infected materials

Post delivery (inhalation of particles from individuals or equipment& hematogenous spread )

Most common cause Gram-negative and -positive bacteriais (*Staphylococcus epidermidis*, Group B *Streptococcus*, *Escherichia coli* and *Ureaplasma urealyticum*).

Risk factors

Maternal systemic infection

Maternal chorioamnionitis

Prolonged rupture of the chorioamniotic membranes

 Premature rupture of the chorioamniotic membrane

Lower socioeconomic status

Signs and Symptoms

May apparent before delivery ( fetal distress or (tachycardia

At delivery (low Apgar score or severe respiratory distress).

Latent period of a few hours or an interval of 1-2 days before respiratory distress

Lethargy or irritability,Poor feeding,Temperature instability ,Poor color

Respiratory signs--tachypnea, apnea, cyanosis, retractions, grunting, nasal flaring and retractions

Diagnosis

Chest radiographs show abnormal findings, including nodular or coarse patchy infiltrates, diffuse haziness or granularity, air bronchogram signs and lobar or segmental consolidation

 Tracheal aspirate(8h)

Gastric aspirate (1-2 h)

Blood culture

Management of Pneumonia

Prevention

Supportive care

Ampicillin and gentamicin

**Meconium Aspiration Syndrome**

Meconium

The first intestinal discharge from newborns

Viscous, dark-green substance composed of intestinal epithelial cells, lanugo, mucus, and intestinal secretions.

Water is the major liquid constituent 85-95%

Sterile and does not contain bacteria

**Pathophysiology**

Fetal distress can cause passage into the amniotic fluid.

It is mainly in a term and post term.

Vagal stimulation from head or cord compression cause peristalsis and relaxation of the rectal sphincter leading to meconium passage.

**Airway obstruction**

Complete obstruction & Partial obstruction

**: Surfactant dysfunction**

Deactivates surfactant and may also inhibit surfactant synthesis

**: Chemical pneumonitis**

Irritate the airways and parenchyma, causing a

release of cytokines

**Persistent pulmonary hypertension of the newborn**

**Can predispose to pulmonary infection**

**Risk factors**

Placental insufficiency

Maternal hypertension

Preeclampsia

Oligohydramnios

Maternal drug abuse, especially of tobacco and cocaine

Maternal infection/chorioamnionitis

Fetal hypoxia

**Clinical Presentation**

The diagnosis of meconium aspiration syndrome requires the presence of

Meconium stained amniotic fluid

Neonate respiratory distress

Characteristic radiographic abnormalities

**Management**

Prevention of meconium aspiration syndrome(NRP)

If the baby is not vigorous ( depressed respiratory effort, poor muscle tone, and/or heart rate < 100 beats/min)🡪 Use direct laryngoscopy, intubate, and suction the trachea immediately after delivery

If the baby is vigorous🡪 Do not electively intubate. Clear secretions and meconium from the mouth and nose with a bulb syringe or a large-bore suction catheter

Supportive care

Ventilatory management

PPHN prevention & management

Antibiotic coverage

Pneumothorax

Presence of air in the pleural cavity between the visceral and parietal pleura, which results in violation of the pleural space.

Loss of intrapleural negative pressure causing lung collapse

Pathophysiology

The main physiologic consequences of a Pneumothorax are a decrease in vital capacity

In a **simple Pneumothorax**, air in the pleural space does not build up significant pressure but allows the lung to collapse without further expansion of the Pneumothorax

A **complicated Pneumothorax** is progressive and consists of continued air leakage into the pleural space and progressive lung collapse.

**Tension Pneumothorax** is a life-threatening emergency

It is caused when air enters the pleural space during inspiration but cannot exit during exhalation

Tension Pneumothorax results in collapse of the involved lung and a shift of the mediastinal structures to the contralateral side.

This causes a decrease in cardiac output as a consequence of decreased venous return and leads to rapidly progressive shock and death if not treated

Signs & symptoms

Increasing respiratory distress

respiratory acidosis & desaturation

Bulging chest

Difficulty hearing breath sounds

Change in the location of heart or lung sounds

Diagnosis

A tension pneumothorax should always be a clinical diagnosis

When an infant is suspected of having a pneumothorax, CXR is taken.

Transillumination of the chest

Treatment

No specific management for asymptomatic Pneumothorax

100% oxygen for full term with no mechanical ventilation

Infants with lung disease, the presence of Pneumothorax accentuates the respiratory difficulty and requires intervention

Percutaneous aspiration or tube thoracostomy (chest tube placement) is typically required for large or symptomatic pneumothoraces.

Tension pneumothoraces need immediate decompression with needle thoracostomy, followed by tube thoracostomy

**Congenital Diaphragmatic Hernia**

Types

occurs in 1 of every 2000-3000 live births and accounts for 8% of all major congenital anomalies

**The** **posterolateral Bochdalek hernia** (occurring at approximately 6 weeks) Lt 85% Vs Rt 13% , Bilateral hernias are uncommon and are usually fatal

**The anterior Morgagni hernia**

**The hiatus hernia**

Pathophysiology

Pulmonary hypoplasia

Pulmonary hypertension

surfactant dysfunction

Presentation

Respiratory distress

Scaphoid abdomen

Barrel-shaped chest

Poor air entry on the affected side left, with a shift of cardiac sounds to the other side

Associated anomalies

**Management**

Placement of OGT

Avoiding mask ventilation and immediately intubate

Avoiding high pressures with mechanical ventilation

Supportive care

Control the PPHN

*Surgery*

Transient tachypnea of the newborn

Present within the first few hours of life with tachypnea and other signs of respiratory distress, increased oxygen requirement

Self-limited disease

Result of a delay in clearance of fetal lung liquid

frequently resolves over a 24-hour to 72-hour period

Risk factors

Cesarean delivery

Maternal asthma and smoking

Prematurity

Male sex and macrosomia

Excessive maternal sedation

CXR

Prominent perihilar streaking, and fluid in the fissures

Management of TTN

Prevention

Supportive care

Ampicillin and gentamicin